

Name: \_\_\_\_\_ Date: \_\_\_\_\_ HR: \_\_\_\_\_

## Learning Set 3: TAG 3.4

### 3.4 Read: Whirligig Science



*Read the introduction on p. 53. What are we going to be learning about today that will help us with designing our whirligig?*

*What are two uses of scientific information?*

- 1.
- 2.

**Gravity:** *Read this section on p. 53.*

*Why doesn't gravity cause the whirligig to fall when you are holding it with your hand?*

**A Push Against Gravity:** *Read this section on p. 54 and look at the diagram following it.*



*What causes an upward push on the whirligig's blades as it falls?*

*What do we call this push?*

*What do scientists call pushes and pulls?*

*What are four common forces we experience?*

*Draw a picture of the air molecules bumping into the whirligig's blades here:*

**Changing the Push and Pull:** *Read this section at the bottom of p. 54. Fill in the cause/effect table:*

Cause	Effect
Adding more paper clips	
Making the blades longer	

Name: \_\_\_\_\_ Date: \_\_\_\_\_ HR: \_\_\_\_\_

**Stop and Think:** *Read this section on the top of p. 55. Think about the following questions on your own, and then discuss with your table group. Then wait for a class discussion.*

1. *How does gravity pull down on a whirligig?*
2. *How does air resistance push up on a whirligig?*
3. *What changes when you add paper clips to the stem? How does that affect the way the whirligig falls?*
4. *What changes when you make the blades longer? How does that affect the way the whirligig falls?*

**Changing the Forces Due to Gravity and Air Resistance:** *Read this section on p. 55.*



*Why is the pull of gravity greater when you add more paper clips to the stem of your whirligig?*

*What happens to the amount of air resistance as you add more paper clips? (Warning: this is kind of a trick question!)*

*Why does increasing the blade length increase the amount of time it takes for your whirligig to fall?*

**Update the Project Board:** *Read this section on p. 56 with the class. Update your project board, including the “What are we learning?” and “What is our evidence?” columns, with the class.*